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## NOTES ON THE BREEDING HABITS OF CAPTIVE DEERMICE

BY ERNEST THOMPSON SETON

At Cos Cob, Connecticut, on August 22, 1905, I caught a female deermouse (*Peromyscus leucopus noveboracensis*), and put her in a large cage on my study table, so as to observe her continually. On September 15, she was found to have a nest of young—three in number and apparently newly born; therefore gestation was at least 23 days. The house mouse is said to carry for 21 days. My notes are as follows:

*October 7.* The young mice are three weeks old, but already half grown and very active. They are of a lead color, blended into dull whitish below. One has a weak hind leg; this one often dances; that is, whirls around and around. I once counted 12 turns right to left, then changing he made 11 turns left to right, then a dozen the other way, then a lot so fast I could not count them. This one is evidently troubled with a nervous disease, but one of the stronger ones also whirls at times. A sudden fright sometimes makes them whirl. The sickly one died when five weeks old.

*October 27.* The young deermice in the cage are now 42 days old and two-thirds grown. One shows a general tinge of brown on flanks and hams. The other is clearly moulting. Along each flank is a line of long unmoulted hair, on the back it is short, sleek and blue.

*April 18, 1906.* On my return home, after an all winter's absence, I find the old deermouse and one young one remaining. The young one, a female, is now of the same fawn color and white as the mother, but though seven months old is not quite so large, which is doubtless an individual peculiarity. They are active chiefly at night. (But two which I had later commonly came out of the nest at noon to sit for a time in the sun, which fell on their cage. This habit I have also seen in the wild ones.)

*April 27.* To-day for the first time I heard the deermice squeak and twitter; they seem to be quarrelling in the nest. On May 4 I put a male deermouse into the cage, and, a few days later, a second one.

*May 14.* The old deermouse female has ceaselessly persecuted the smaller male. To-day he got out and escaped up the chimney, leaving the older male with the two females. The little female showed signs of heat to-day and yesterday, following the old male, sniffing at his rear and nibbling his legs. To-day I gave them a convenient nesting box in the cage. The young female was wildly excited, rushing in and out, preparing a nest. The old male is heard drumming frequently.

Twice I saw him in the act; it is done with one front paw striking down on any near object, so fast that one sees a mere haze of paws for the half second that it lasts. (Later I had a male that drummed a little with his tail.) The little female made a hammering as she scratched herself with a hind foot; but I have not yet seen a female make the drumming. (Later, I kept two females for some weeks, and never once heard them drum.)

These mice often squeak shrilly while fighting with each other. (Later I noted one that gave off a succession of squeaks when caught in a trap.) These observations on the voice are of interest since M. A. Walton, who first recorded the drumming of these mice, says they are

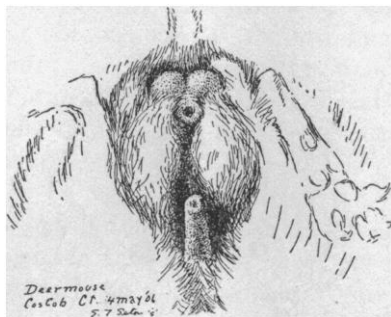


FIG. 1. EXTERNAL GENITALS OF *PEROMYSCUS LEUCOPUS NOVEBORACENSIS*.  
MALE.

One and one-half times natural size.

“completely dumb.” It is always dangerous to say that an animal with vocal organs is dumb. In this case, the voice may be so high pitched that only very young, or very sharp ears can hear it.

*June 4.* To-day one of the mice, the younger female, is obviously near bringing forth young.

*June 9.* The young mice, 3 in number, were born either yesterday or the day before, so that gestation apparently is 23 days. One of them, measured June 10, was in body  $1\frac{7}{16}$  inches long, tail  $\frac{7}{16}$  inches. When it was left at the door, the mother nosed it, whiskered it, then carried it back to the nest. When they were 11 days old, I chanced to disturb the mother mouse. She ran out with two of the young attached to her inguinal teats. Although she ran fast, turned, twisted, climbed the bars, carried stuff to the nest and rebuilt it, they hung on, bumping along with every inequality. Later I saw her remove one of

them by force and carry it in her mouth to the nest. (I have also seen them in the woods, carrying their young both ways.) One young which I measured was, body 2 inches long, tail  $1\frac{1}{16}$ . It was fully haired, but eyes not open.

This same day, I put the father mouse back in the cage with the family. He at once ensconced himself in the nest, despite the mother, who fought him off a number of times, uttering meanwhile a thin twittering. He did not resist but held up his paws whenever she approached. When I removed most of the nest, he helped the mother to carry it back and pack it around themselves and the young ones.

June 21. The young still have their eyes tight closed (13th day). I examined one out in the sunlight, but saw not the beginning of a per-

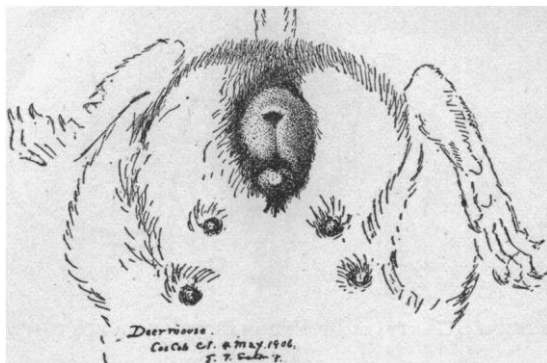


FIG. 2. EXTERNAL GENITALS OF *PEROMYSCUS LEUCOPUS NOVEBORACENSIS*.  
FEMALE.

One and one-half times natural size.

ture. They are now big and strong, and sometimes wander outside the nest. At once mother, never father, carries them back. Nevertheless, father cuddles them much when in the nest. Often they hang onto the mother's teats, when she comes out. So far it has been always the inguinal teats, never the pectoral, that are so used.

June 23. The young mice have their eyes open to-day (the 15th day). They are now about half the dimensions and a quarter the weight of the mother. They are very active and climb extremely well. I saw the tail of one projecting from the nest and gently lifted him up by it. To my surprise I also lifted his mother to whom he was attached and his two brothers who were attached to her, all by the inguinal teats. On June 26 (18th day) I saw them for the first time running

like old ones and scrambling over the bars of the cage. On July 18 (40 days old), they were completely weaned and nearly full grown.

*June 6.* To-day saw signs of rut in the old pair of deermice. In thirteen days the female was well advanced in pregnancy. On June 22, the 16th day, she was found with 4 new-born young tight on her teats; 3 on the inguinal, 1 on the pectoral; which may mean that I was wrong about the mating time. On the 16th day after birth, their eyes are fully opened, and they are very active.

These mice are extremely fond of nuts and can quickly get at the meat of a shellbark. But when given choice, they went first for some acorns and finished them, before touching the hickories. They killed and devoured a cicada that was put with them.

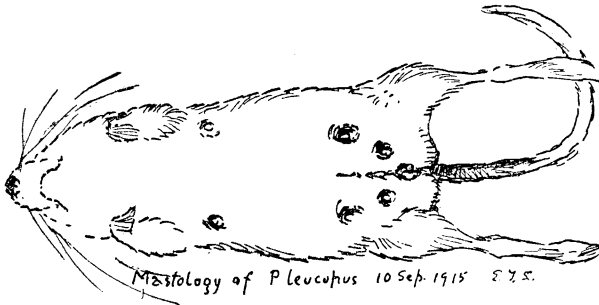


FIG. 3. MAMMÆ OF PEROMYSCUS LEUCOPUS.  
Two-thirds natural size.

At another time I had but one deermouse in the cage when a meadowmouse (*Microtus*) arrived and was put in to keep him company. I watched closely fearing that they might fight, in which case I expected it would be necessary to rescue the deermouse. But it turned out otherwise.

The deermouse made one or two darts of bewildering quickness, and the meadowmouse beat a retreat. Within two days they were good friends, and made a joint nest in a curl of birch bark. Though much more intelligent than his friend, the deermouse had made little effort to escape from the cage, but the meadowmouse spent most of his time gnawing at the wooden parts of the frame. In particular he worked at the upper part where he had to cling and gnaw at the same time.

After a fortnight I set both at liberty in the woods. The meadow-mouse kept on running, dodging behind logs and sticks, using every shelter, but still running until it found a hole. The deermouse gave three or four long bounds, got behind a tree, then squatted flat on the leaves. I followed and found him. Again he got out of sight and squatted. This he did as often as I followed, until he had the luck to find a hole. When squatted on the leaves his color so closely matched them, that he was very hard to see.

*Greenwich, Connecticut, October 3, 1919.* Found a deermouse's nest in the tangle about 18 inches from the ground and against the side of a log. It contained 2 adults, and 2 young ones about two-thirds grown; I should say they were 6 weeks old.

*October 5.* Found the mother and 4 young in the nest.

*October 7.* Both adults in the nest to-day and, with them 5 young in gray pelage.

*October 8.* Last night for the first time it was very cold. Our first touch of frost; this morning the nest was empty.

*October 9.* Mild once more; 4 young in the nest this morning.

*October 10.* Dull and warm. The mother and her brood in the nest this morning.

*October 11.* Mother and young in nest.

*October 13.* Frost last night, the nest empty. Found a young deermouse drowned in a well 50 feet away.

*October 14.* One young deermouse in nest to-day.

*October 16.* Warm night, one old deermouse in nest; one young fished alive out of the well (one drowned there on 13th); a third found wandering alone 40 feet from the nest. Maybe all are of the same brood.

*October 17.* Sharp frost again last night. The deermouse nest deserted finally.

These observations seem to show first, that both parents take part in caring for the young; which implies that the species is strictly monogamous. Second, that they have more than one nest, and these are suited to different kinds of weather; this habit is known also among squirrels.

As a concluding item, a note from my journal of October, 1904: I found a deermouse's nest among some old carpets in an outhouse. It had an unpleasant smell; when opened it contained three tiny young ones, apparently new-born, dead and dried up, and with these the dead body of the mother at the moment of maternity with another young one. Mere fragments of evidence, but enough to bring a sympathetic tear to the eye of one who knew the mother's pain.